FIG. 1

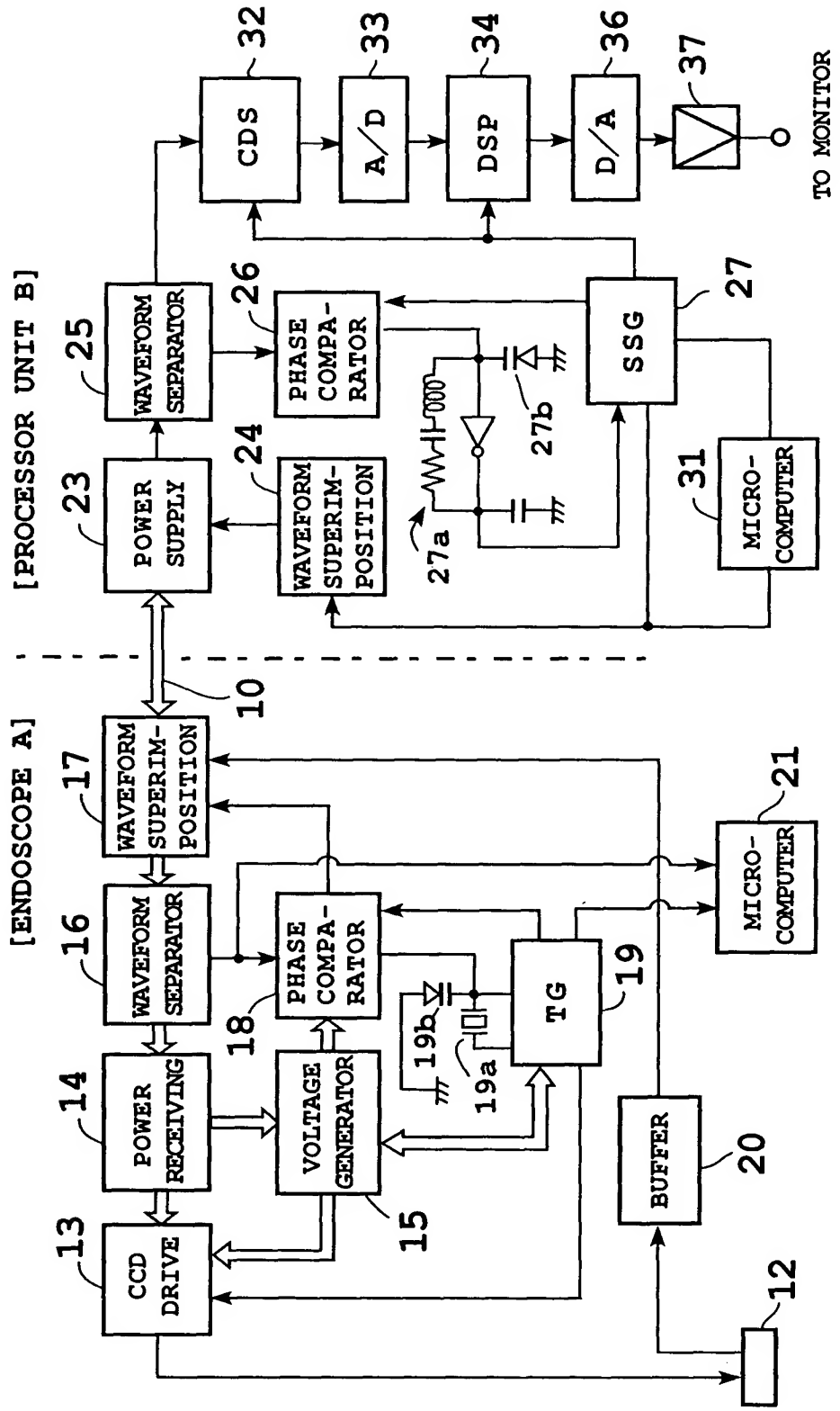
[ENDOSCOPE A]
[PROCESSOR UNIT B]
10
12
13 CCD DRIVE
14 POWER RECEIVING
15 VOLTAGE GENERATOR
16 WAVEFORM SEPARATOR
17 WAVEFORM SUPERIM-POSITION
18 PHASE COMPA-RATOR
19 TG
19a
19b
20 BUFFER
21 MICRO-COMPUTER
23 POWER SUPPLY
24 WAVEFORM SUPERIM-POSITION
25 WAVEFORM SEPARATOR
26 PHASE COMPA-RATOR
27 SSG
27a
27b
31 MICRO-COMPUTER
32 CDS
33 A/D
34 DSP
36 D/A
37
TO MONITOR

FIG. 2

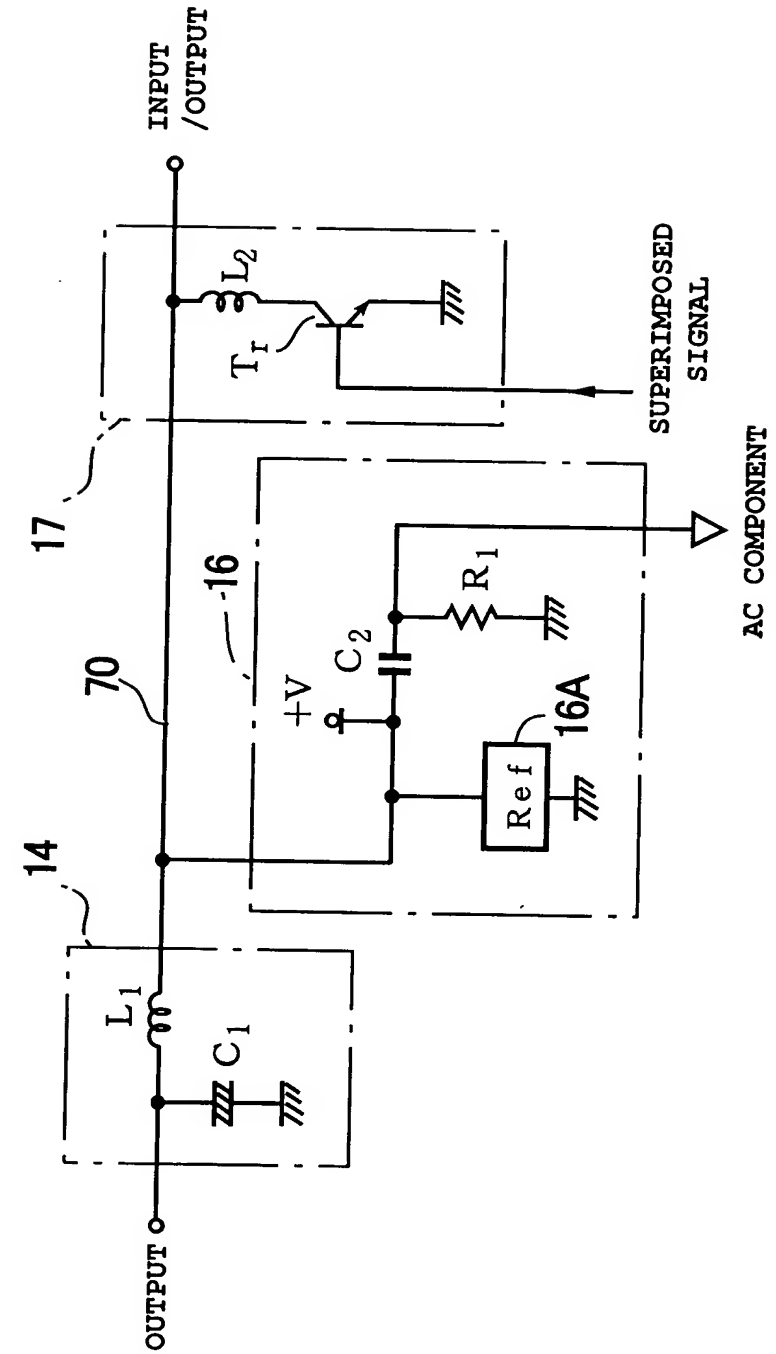
INPUT /OUTPUT
L_2
T_r
SUPERIMPOSED SIGNAL
17
16
R_1
C_2
+V
70
16A
Ref
AC COMPONENT
14
L_1
C_1
OUTPUT

FIG.3

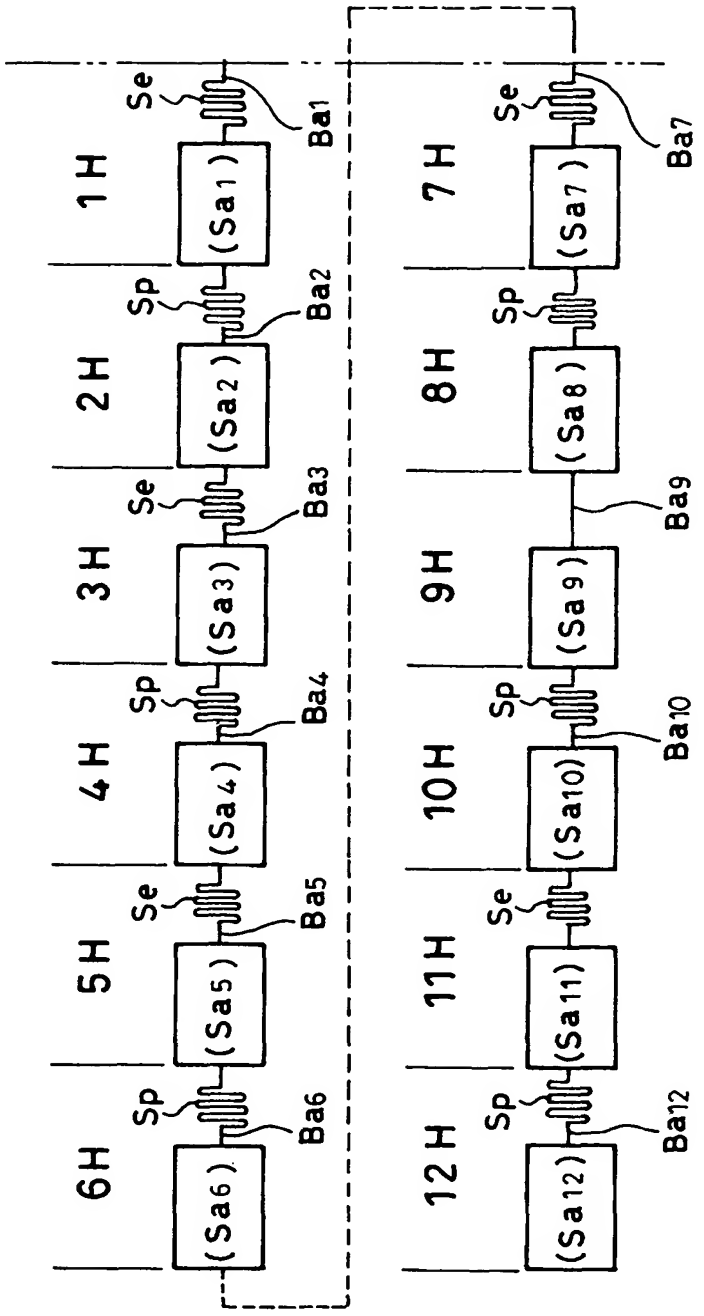
1H
2H
3H
4H
5H
6H
7H
8H
9H
10H
11H
12H
(Sa1)
(Sa2)
(Sa3)
(Sa4)
(Sa5)
(Sa6)
(Sa7)
(Sa8)
(Sa9)
(Sa10)
(Sa11)
(Sa12)
Se
Sp
Ba1
Ba2
Ba3
Ba4
Ba5
Ba6
Ba7
Ba9
Ba10
Ba12

FIG. 4

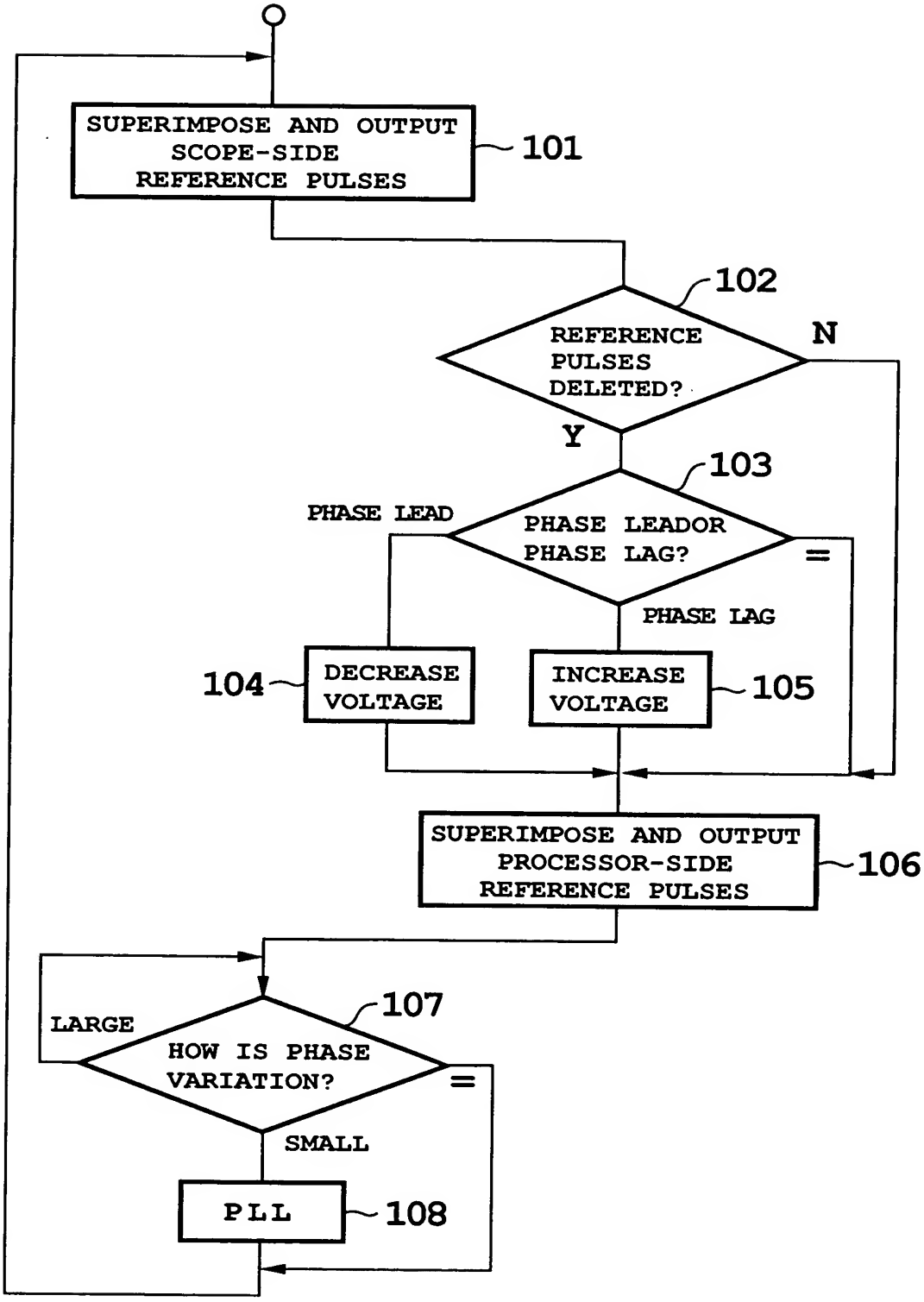
SUPERIMPOSE AND OUTPUT SCOPE-SIDE REFERENCE PULSES
101
102
REFERENCE PULSES DELETED?
N
Y
103
PHASE LEAD
PHASE LEADOR PHASE LAG?
=
PHASE LAG
104
DECREASE VOLTAGE
INCREASE VOLTAGE
105
SUPERIMPOSE AND OUTPUT PROCESSOR-SIDE REFERENCE PULSES
106
LARGE
107
HOW IS PHASE VARIATION?
=
SMALL
PLL
108

FIG. 5

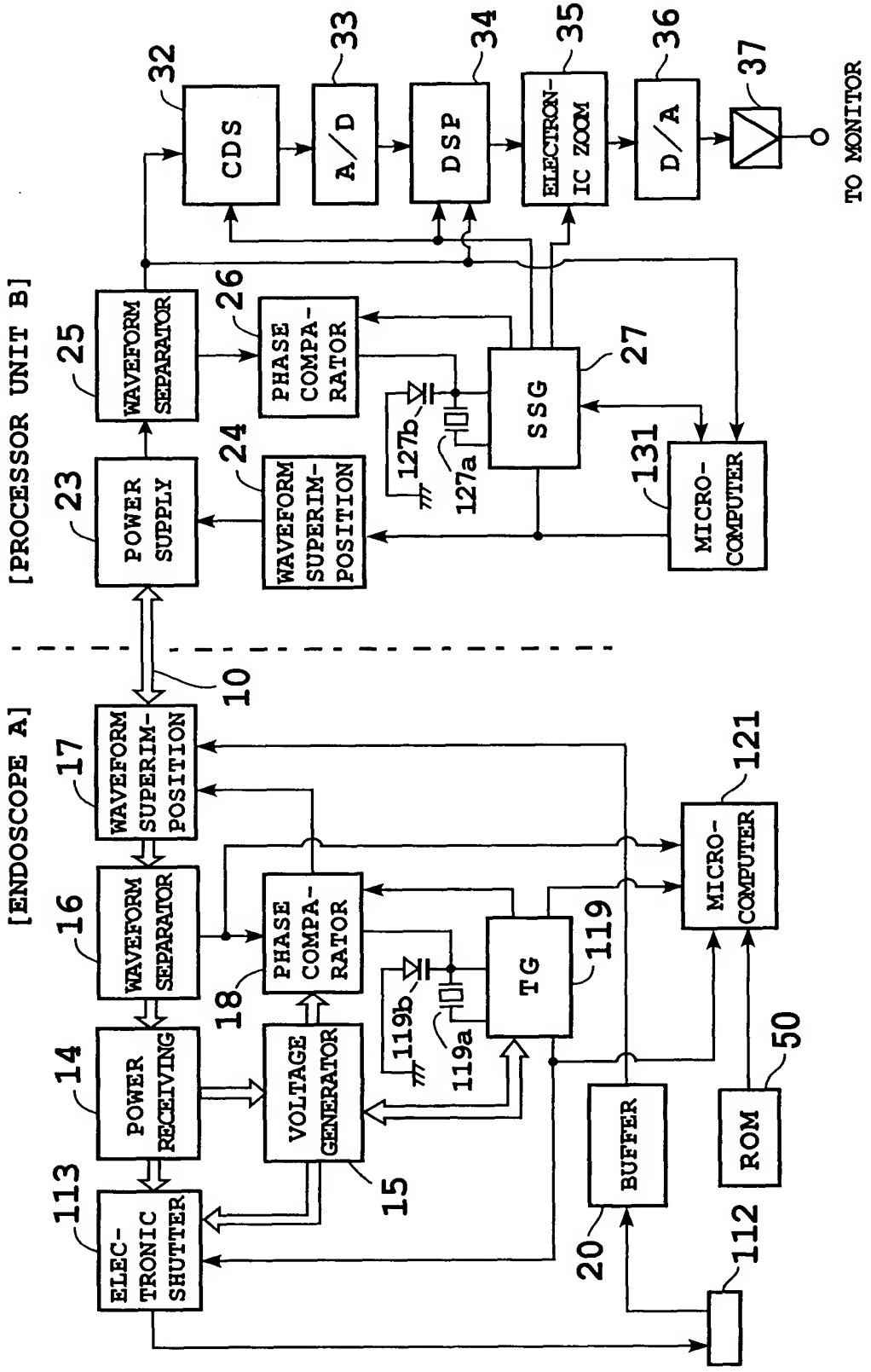
[ENDOSCOPE A]
[PROCESSOR UNIT B]
10
WAVEFORM SUPERIM-POSITION
17
WAVEFORM SEPARATOR
16
POWER RECEIVING
14
ELEC-TRONIC SHUTTER
113
PHASE COMPA-RATOR
18
VOLTAGE GENERATOR
15
119b
119a
TG
119
MICRO-COMPUTER
121
BUFFER
20
ROM
50
112
POWER SUPPLY
23
WAVEFORM SUPERIM-POSITION
24
WAVEFORM SEPARATOR
25
PHASE COMPA-RATOR
26
127b
127a
SSG
27
MICRO-COMPUTER
131
CDS
32
A/D
33
DSP
34
ELECTRON-IC ZOOM
35
D/A
36
37
TO MONITOR

FIG. 6

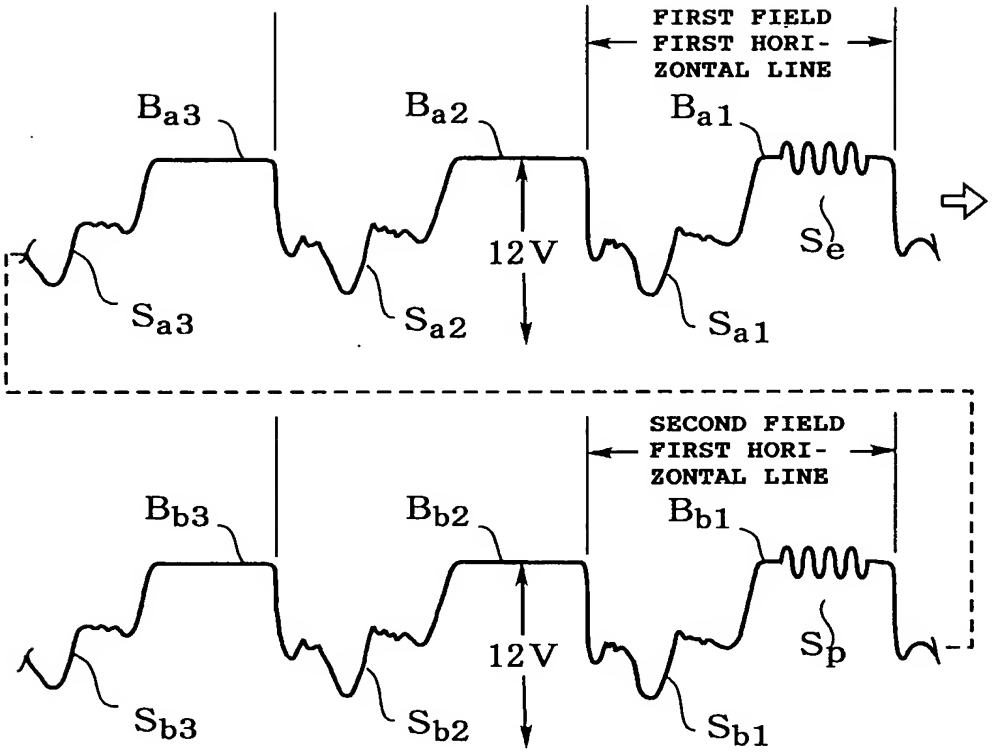
FIRST FIELD
FIRST HORI-
ZONTAL LINE
B_{a3}
B_{a2}
B_{a1}
12V
S_e
S_{a3}
S_{a2}
S_{a1}
SECOND FIELD
FIRST HORI-
ZONTAL LINE
B_{b3}
B_{b2}
B_{b1}
12V
S_p
S_{b3}
S_{b2}
S_{b1}

FIG. 7

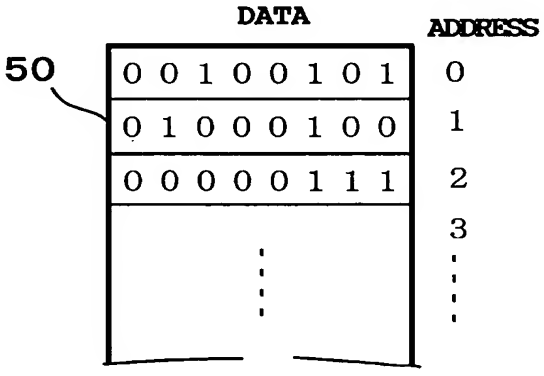
DATA
ADDRESS
50
0 0 1 0 0 1 0 1
0 1 0 0 0 1 0 0
0 0 0 0 0 1 1 1
0
1
2
3

FIG. 8

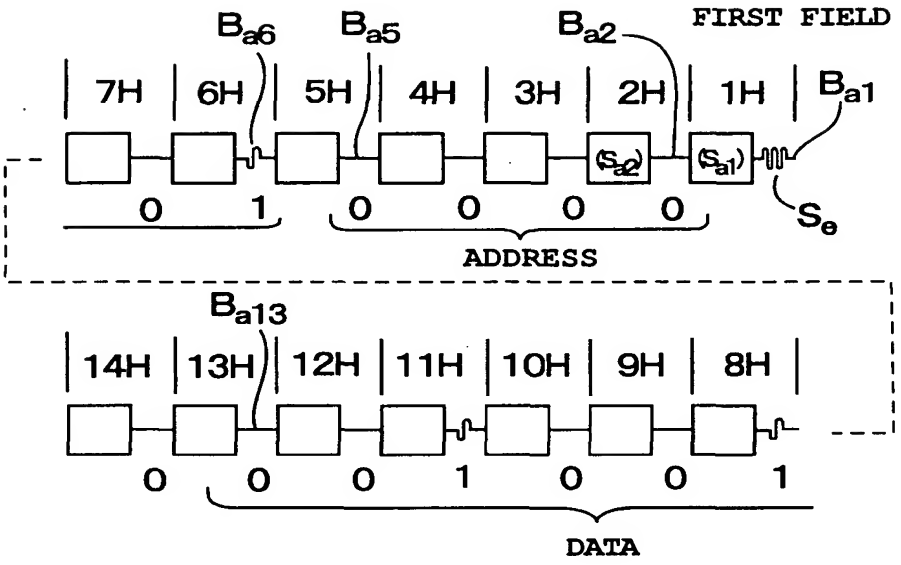
FIRST FIELD
B_{a6}
B_{a5}
B_{a2}
B_{a1}
7H
6H
5H
4H
3H
2H
1H
S_{a2}
S_{a1}
S_e
0 1 0 0 0 0
ADDRESS
B_{a13}
14H
13H
12H
11H
10H
9H
8H
0 0 0 1 0 0 1
DATA

FIG. 9

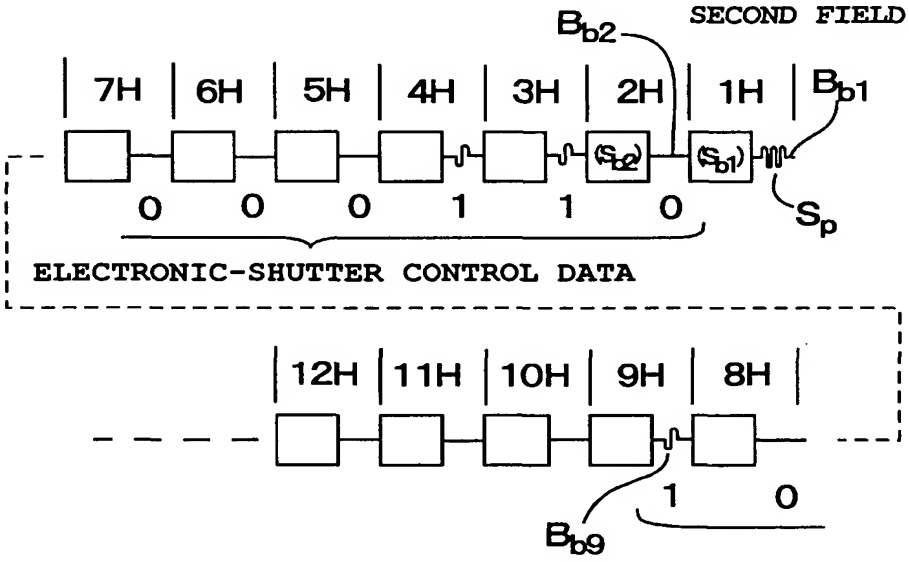
SECOND FIELD
B_{b2}
B_{b1}
7H
6H
5H
4H
3H
2H
1H
S_{b2}
S_{b1}
S_p
0 0 0 1 1 0
ELECTRONIC-SHUTTER CONTROL DATA
12H
11H
10H
9H
8H
1 0
B_{b9}

FIG. 10

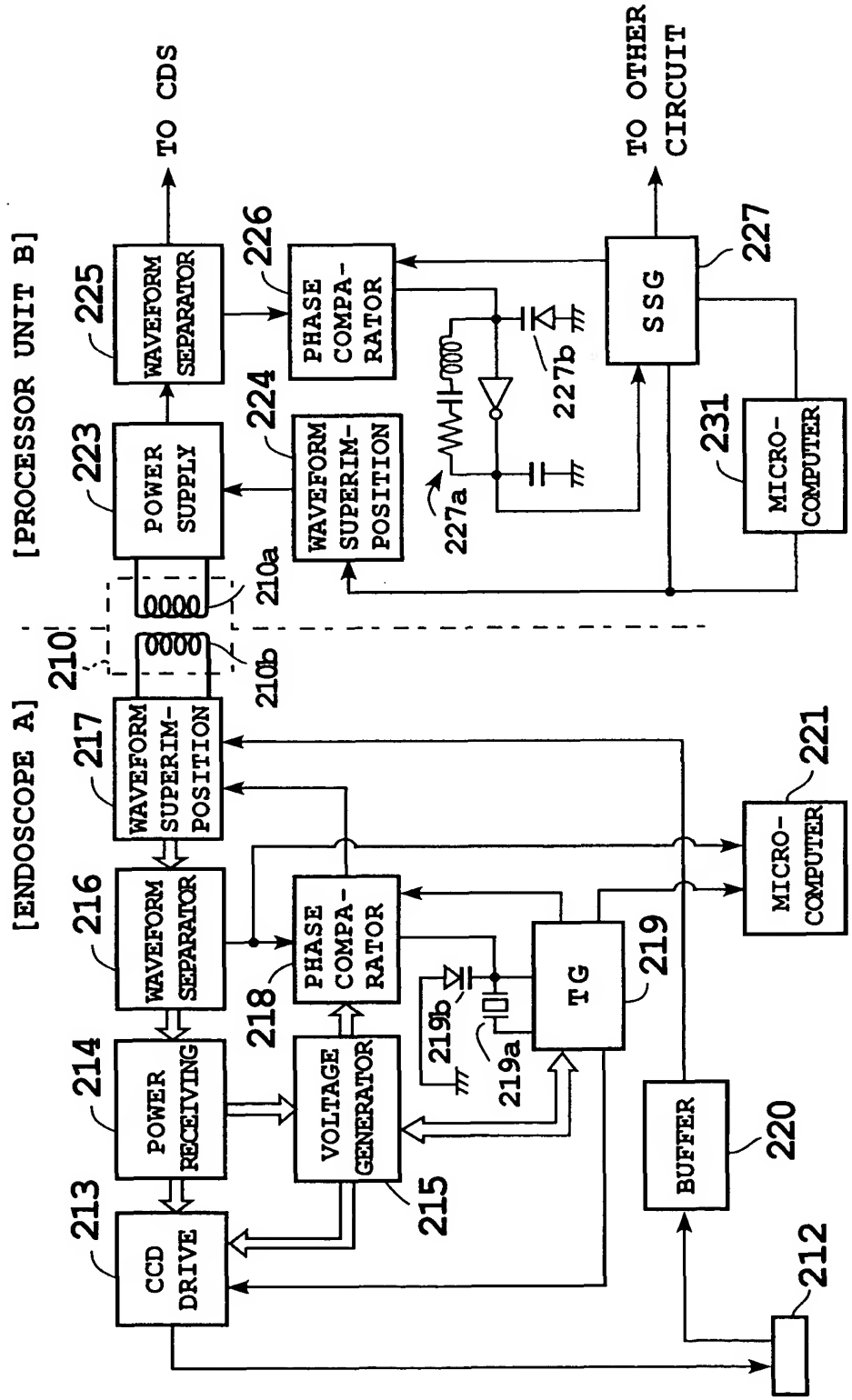
[ENDOSCOPE A]
[PROCESSOR UNIT B]
TO CDS
TO OTHER CIRCUIT
CCD DRIVE
213
POWER RECEIVING
214
WAVEFORM SEPARATOR
216
WAVEFORM SUPERIM-POSITION
217
VOLTAGE GENERATOR
215
PHASE COMPA-RATOR
218
TG
219
219a
219b
BUFFER
220
MICRO-COMPUTER
221
212
210
210a
210b
POWER SUPPLY
223
WAVEFORM SUPERIM-POSITION
224
WAVEFORM SEPARATOR
225
PHASE COMPA-RATOR
226
SSG
227
227a
227b
MICRO-COMPUTER
231

FIG.11

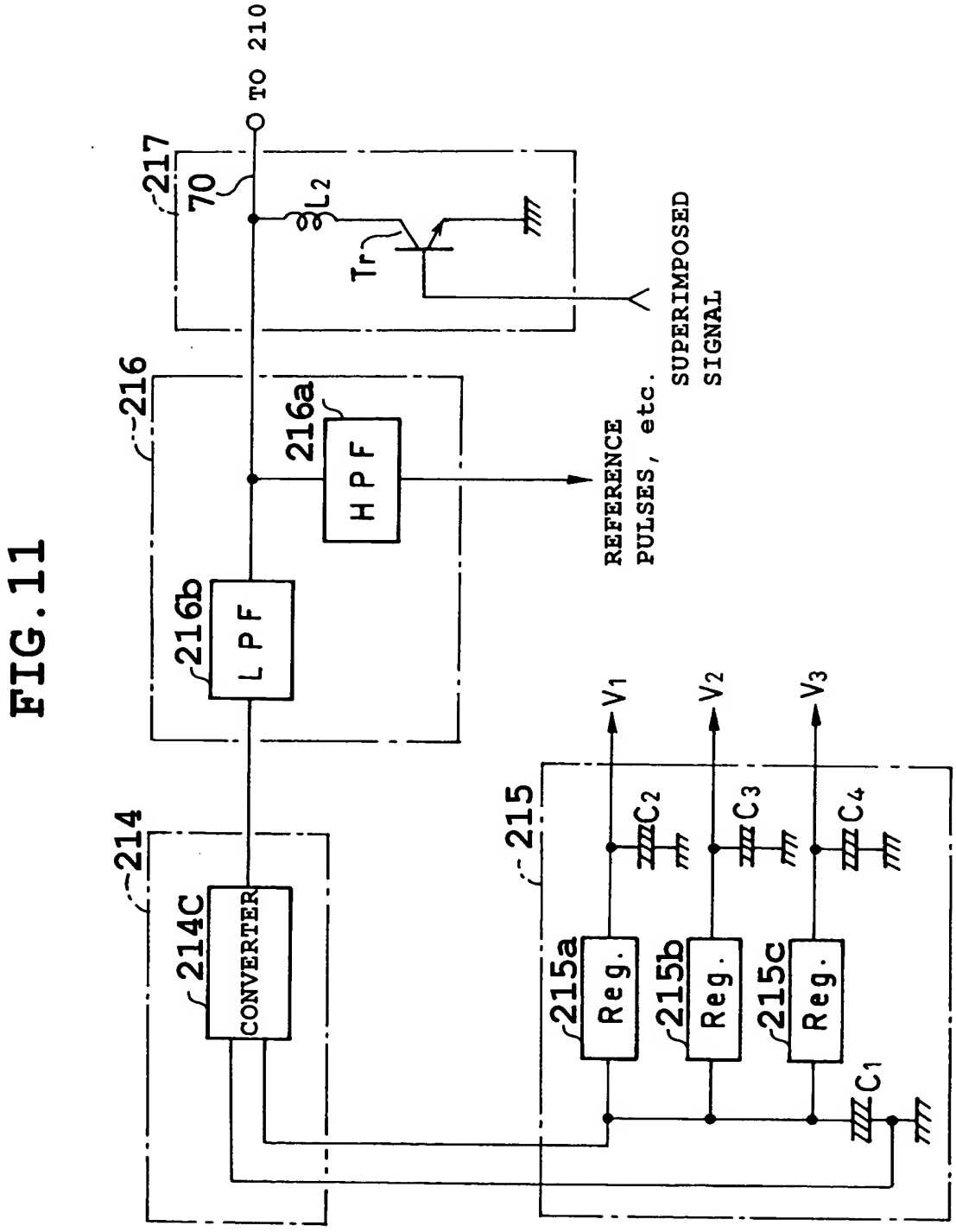
TO 210
217
70
L2
Tr
SUPERIMPOSED SIGNAL
216
216a
HPF
REFERENCE PULSES, etc.
216b
LPF
214
214C
CONVERTER
215
V1
V2
V3
C2
C3
C4
C1
215a
Reg.
215b
Reg.
215c
Reg.

FIG.12

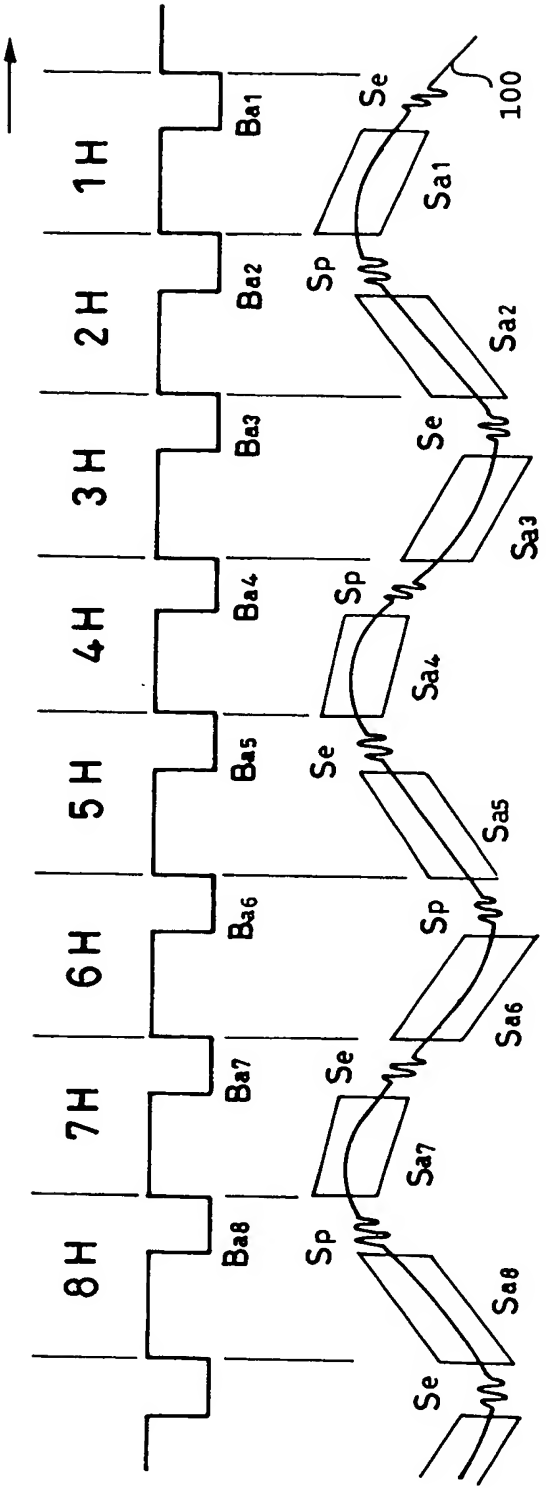
1H
2H
3H
4H
5H
6H
7H
8H
Ba1
Ba2
Ba3
Ba4
Ba5
Ba6
Ba7
Ba8
Se
Sp
Sa1
Sa2
Sa3
Sa4
Sa5
Sa6
Sa7
Sa8
100

FIG.13 PRIOR ART

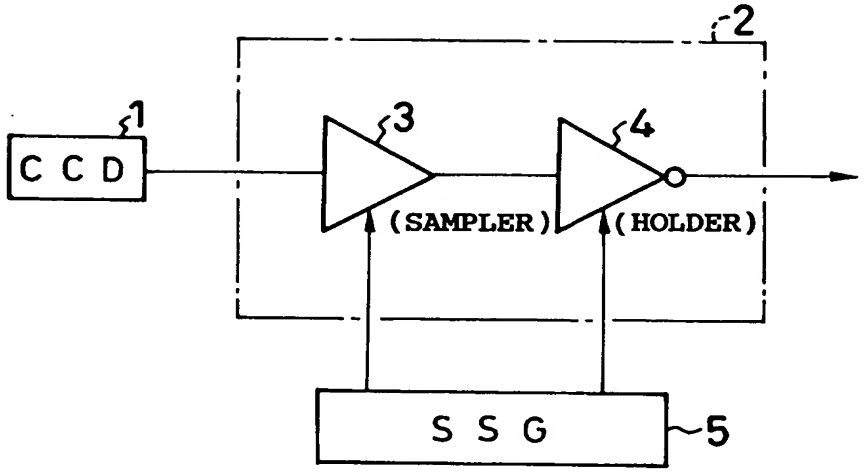

FIG.14(A) PRIOR ART

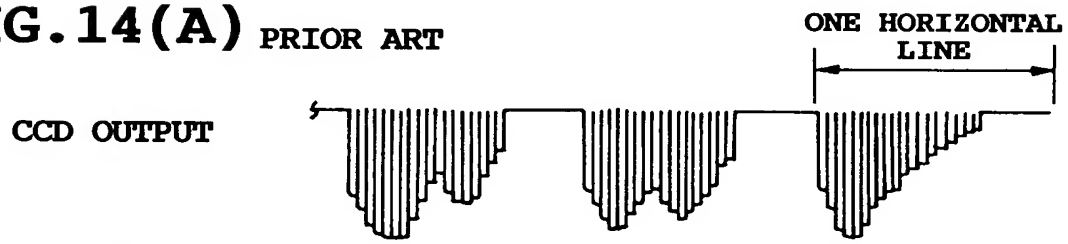
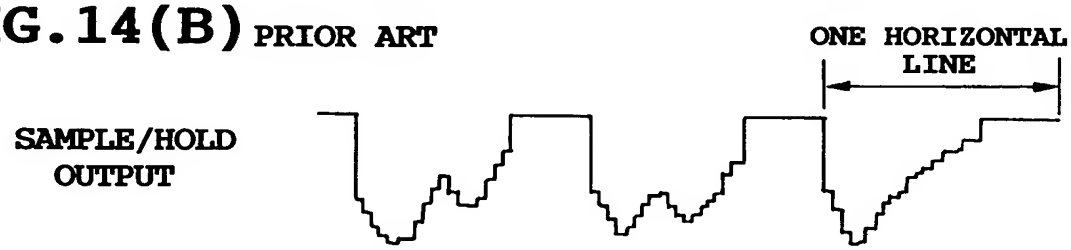
FIG.14(B) PRIOR ART